



Precast Cable Trench System Product Information

Introduction:

The Langley Concrete Group manufactures precast solid bottom, one piece cable trench boxes which can be used in place of cast in place trenches or duct bank designs that are used for installation of electrical cables, power cables and mechanical piping systems.

The LCG Cable Trench System is a component system that can be customized in almost every way possible to provide a solution to the requirements of the underground civil infrastructure construction industry.

Various options and accessories ranging from Unistrut and weld plates, ground cable clips, dividers, cable support blocks and being able to adapt to designer's special requirements makes the precast trench cable system the efficient, cost effective choice.

The advantages of precast cable trench boxes include the following:

Economy – LCG Cable trenches are very competitive with cast-in-place trenching with the higher cost of forming on site, access requirements and quality control issues.

Accessibility – Duct bank installations and direct buried systems are much more restrictive than LCG Cable Trenches for future maintenance and expansion of an installed system.

Durability – Made from quality high strength and very durable precast concrete manufactured in an enclosed plant environment using modern concrete casting technology provides a long lasting, durable trench component system.

Flexibility - LCG concrete cable trenches, using standard sizes or creating custom application designs, provides designers the opportunity to address most any site installation requirement. Concrete provides an unlimited ability to create tees, bends, angles, side by side installations and custom designed solutions to most specific site issue.

Leak Containment – LCG Cable Trenches are made of high density concrete and when designed and installed properly provide leak containment capability beyond many other systems.

Quality Control and Consistency - LCG Cable Trenches are manufactured in a quality certified, controlled environment plant facility with full time quality assurance monitoring. Our steel forms used to cast the trenches are built to specific dimensions and provide consistent, reliable components to the installation contractor.

To address the needs of most common site installations, LCG Cable Trenches are designed and supplied to three specific standard design loading applications;

- 1) **Pedestrian Loading:** 14.4 kN/m² for foot traffic only.
- 2) **Maintenance Vehicle Loading:** 80 kN/m² for pickup or light maintenance vehicle at restricted speed.
(Reference: CHBDC S6-06-3.8.11 & figure 3.4).
- 3) **Highway Vehicle Loading:** For truck type loading at speeds equal to highway conditions.
(Reference: CHBDC CL-625 and/or AASHTO H20)

Cable Trench Sections and Lid Sizes:

1. **500 Series Cable Trench Sections:** 3048mm (Length) x 508mm (Width) x 610mm (Height)
(See attached Drawing No. PCT-TYPE A for more detail.)
2. **500 Series Concrete lids*:** 610mm (Length) x 660mm (Width) x 76mm (Thickness)
3. **700 Series Cable Trench Sections:** 3048mm (Length) x 762mm (Width) x 610mm (Height)
(See attached Drawing No. PCT-TYPE B for more details.)
4. **700 Series Concrete lids*:** 508mm (Length) x 914mm (Width) x 76mm (Thickness)
5. **Custom Trench Box:** 300-3050mm (Length) x 508-1200mm (Width) x 305 x 610mm (Height)
(See attached Drawing No. PCT-custom for more details.)
6. **Custom bends and Tee structures:** Available upon request for all cable trench series.
7. **Cable trench sections designed for Highways loadings:** Units can be designed to CHBDC CL-625 and/or AASHTO HS20 loadings please contact LCG sales office for more detail.

**Lids for standard sizes can be supplied in alternate lengths, contact LCG sales staff for more detail.*

Installation Guidelines:

Unloading and storage

- 1) As with any material used on a job site, care should be taken in the handling of LCG Cable Trench system components.
- 2) Though manufactured using very high strength concrete and reinforced for the application specified, concrete can and will easily chip or break when handled improperly.
- 3) LCG recommends using a forklift to unload and handle the trench components onsite if possible. If a forklift is not available the use of spreader bar to insure proper angle of lift is achieved and damage is prevented due to pinching of the product with lifting cables or chains.
- 4) The LCG Cable Trench System is supplied with engineered cast in lift inserts. The lift insert requires a specific clutch to enable the lifting of the components. Clutches are supplied with the first delivery to site. At no time should any attempt to lift without the proper clutches be made. This may cause injury or possibly death due to failure of the lift insert.
- 5) The components shall be stored on level ground and where possible with dunnage in place to protect the product from the stresses of uneven loading.
- 6) Stacking of the product shall not be permitted without proper dunnage in between all components.
- 7) Safety should always be taken into consideration when lifting any material. Please insure properly rated chains, slings and spreaders bars are used in the unloading and installation of LCG Cable Trench Systems.

Trench Excavation & Installation Procedure:

- 1) Trench excavation, installation and back filling material and compaction requirement are the responsibility of the onsite contractor.
- 2) Proper soil support under the bottom of the trench box is necessary to maintain the uniform reaction forces to the unit. When ground water is present in the trench & work area, dewater to maintain stability of in-situ and imported materials. Maintain water level below trench bedding and foundation to provide a stable trench bottom.
- 3) Installation, foundation and bedding as required by the project engineer according to conditions in the trench bottom. If the foundation is unsuitable, it must be removed to a minimum depth of 152 mm below the trench component bottom and replaced with approved material. A soft, unstable foundation may result in unequal settlement of the trench box and cause the structure to fail. When unsuitable or unstable material encountered, the foundation shall be stabilized.
- 4) Tee connections and bends shall be installed in a manner that will minimize differential settlement between the installed pieces.
- 5) Provide a firm, stable, and uniform bedding for the concrete cable trench box. The bedding shall be constructed uniformly over the full length of trench box to distribute the load bearing reaction uniformly on the trench box over its full length. If placed in layers, the thickness of the layers shall be as required to achieve the specified compaction as required by the project specifications.
- 6) Backfilling should be done in layers and firmly compacted. Compaction equipment and compaction load shall be applied as per the project engineer's requirement. Vibratory compaction loads shall be carefully applied to the unit to avoid any structural damage during the compaction process.

Setting Lids

- 1) Cable trench lid installation shall be performed after backfill is in place and properly compacted around the trench boxes.
- 2) Care should be taken when installing all covers. Impact from improper handling or dropping a cover can easily exceed the design load of the cover and damage it beyond use.
- 3) The lid installation should start at a fixed point and work in the same direction. It is not recommended to start at multiple points and try to match at various points on the trench system.
- 4) The lids should match the joint spacing of the installed trench unit. Overlapping joints may cause an uneven bearing surface that will reduce the load capacity and damage the cover.
- 5) Equipment used for installation of trench system and lid can easily exceed the design loading for the components supplied. Care should be taken to insure that no equipment drive or be placed on top of the trench system unless it has been verified that it does not exceed the design load rating.
- 6) After lid installation is completed a visual inspection shall be performed to determine if any of the lid sections are not seated properly. The lids shall be level and gapped with minimum spacing to insure that they will perform as designed. Any lids not installed properly shall be removed and re-installed.

For inquiries or questions regarding LCG Precast Cable Trench System Please Contact our offices at:

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GENERAL SPECIFICATIONS FOR PRECAST CABLE TRENCH SYSTEM

1. SCOPE

- 1.1 Provide a precast concrete underground utility trench system (for electrical cabling or mechanical piping) as manufactured by Langley Concrete LP of Langley, B.C. The manufacturer must have proven ability and experience in design and manufacture of similar products and have the appropriate facilities to insure a quality product is manufactured and supplied as specified herein, without delay to the specified and accepted delivery schedule.

2. DESIGN

- 2.1 The precast components shall be designed to conform to the requirements of the following;
 - 2.1.1 ASTM C857 "Practice for Minimum Structural Design Loading for Underground Precast Utility Structures"
 - 2.1.2 ASTM C858 "Specifications for Underground Precast Concrete Utility Structures"
- 2.2 The precast components shall be designed to the loading requirement specified by the consultant and/or design engineer.
- 2.3 When required by the consultant, the design shall be sealed by an engineer with certification in the Province or State of the actual installation.

3. MATERIALS

- 3.1 Cement shall conform to CSA A3001.
- 3.2 Flyash shall conform to CSA A3001.
- 3.3 SCC concrete where used shall conform to CAN/CSA A23.1 & A23.2.
- 3.4 Fine and coarse aggregates shall conform to CAN/CSA A23.1 & A23.2.
- 3.5 Chemical admixtures shall conform to CAN/CSA A23.1 & A23.2
- 3.6 Steel reinforcing bars shall conform to ASTM A 615 or A 706 & CAN/CSA G30.18.
- 3.7 Steel reinforcing wires shall conform to ASTM A 82 or ASTM A 496.
- 3.8 Steel reinforcing welded wire mats shall conform to ASTM A 185 or A 495.
- 3.9 Embedded steel shapes and plates shall conform to CAN/CSA G40.20-04.

4. CONCRETE

- 4.1 Batching, mixing, and placing of concrete shall conform to CSA A23.1 & A23.2.
- 4.2 Concrete shall obtain a minimum compressive strength of 35 MPa at 28 days.
- 4.3 Concrete shall contain 5% entrained air by volume (plus or minus 1%)
- 4.4 Concrete testing shall be performed by ACI certified technician.

5. REINFORCEMENT

- 5.1 Fabrication and placement of reinforcement shall conform to CSA A23.1.

6. QUALITY ASSURANCE

- 6.1 The manufacturer shall be currently certified by a recognized third party quality assurance program directly related to the manufacture of precast concrete products.
- 6.2 The manufacturer shall be required to provide all quality inspection records for the manufacture of the concrete components as requested by the consultant, design engineer or customer.

7. SUBMITTALS

- 7.1 Engineering design shall be submitted to the consultant prior to manufacture of concrete components.
- 7.2 Layout drawings shall be submitted for approval prior to manufacture of concrete components.
- 7.3 All drawings shall include dimensions, installation layout, identification of all components and designation of design loadings used.